27 June 2003

Memorandum in Response to the Commission's NOI for Broadband Internet Over Power Line Service (BPL) FCC 03-100

In the Matter of Inquiry Regarding Carrier Current Systems, including Broadband over Power Line Systems, ET Docket No. 03-104.

To: The Commission

From: Robert L. Atkinson
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In theory, the internet access potential given by BPL technology is exciting. I am pleased that the Commission has sought comments from spectrum users via this NOI and am grateful for the opportunity to respond to it. I am further pleased that in the NOI, the Commission has expressed an interest in protecting licensed occupants of the HF spectrum. Protection is especially important given that many of these occupants, including the Amateur Radio Service, play an important role in national security and emergency service.

As you know, the first paragraph of the Notice (I. Introduction 1) introduces BPL by alluding to the seemingly poor broadband service existing in rural areas. There appears to be an assumption that rural areas have little or no access to broadband service and that terrestrial services are without competition. Comments to this effect are repeated in various places through the Notice (see numbered paragraph 9; page 18 2nd paragraph; page 19 1st paragraph; and page 20 1st paragraph). In fact, there is no part of North America, including Alaska, that is without continuous connect internet service due to the current availability of two-way Hughes Direcway satellite access, which is priced at rates competitive with terrestrial service (http://www.direcway.com/). This assumption seems to partly justify the Commission's call for urgency in the deployment of BPL. However, it is my hope that the Commission will realize that it is at a point at which a measured assessment of BPL's interference potential, with regard to licensed HF spectrum users, would be a wise undertaking.

Allow me to address a few of the questions raised in the Notice:

In paragraph 20, bulleted item 7 you ask, "What mitigation techniques are used by In-House BPL systems to avoid possible interference with licensed radio services," and in paragraph 17, bulleted item 1 you mention in-house BPL systems (HomePlug) operating in the frequency range of 4.5 to 21 MHz. I would like to point out that these devices now should contain notch filters covering the amateur radio bands due to interference problems with amateur radio stations following their initial rollout.

In the Paragraph 20 you ask if there are any reports that may assist in the further analysis of harmful interference. By way of a response, please view the streaming videos that detail interference following the deployment of BPL in Tirol and Linz Austria. Links to these videos are at the end of this Memorandum.

I respectfully ask the Commission to move with caution in this area so that, should BPL be deployed, no interference to high frequency spectrum users results. Indeed, the Commission's Part 15 covering this sort of technology in its current form can allow for a high degree of interference to HF users located near power lines. Further, unlike point sources of interference that are comparatively easy to locate and correct, the nature of BPL radiation patterns would

make it a multipoint source, capable of saturating the near-field space of other users. For these reasons, in answer to the question in bulleted item 3 of paragraph 20, I believe there is definitely a need to define frequency bands that must be avoided in order to protect the licensed users on the same frequencies as those used by access BPL systems. In fact, users occupying frequency bands, and engaged in weak signal work such as scientific experimenters and amateur radio operators, are probably most in need of protection. As a first step in this direction, concerned users of the BPL spectrum should have access to industry testing, with the ability to insure independently that the test results meet acceptable standards to allow for the continued operations of these users as high frequency spectrum occupants.

Thank you for your consideration of these comments.

Robert L. Atkinson

Video Showing Effect of PLC in Tirol, Austria
Internet: http://www.darc.de/referate/emv/plc/plc_video_tirol.rm
Summary: This video with sound shows the strong levels of interference experienced to an HF receiver brought to Tirol, Austria during PLC field trials.
Author: OVSV, Austrian Amateur Radio Society

Video Showing Effect of PLC in Linz, Austria
Internet: http://www.darc.de/referate/emv/plc/plc_video_linz.rm
Summary: This video with sound shows the strong levels of interference experienced to an HF receiver brought to Linz, Austria during PLC field trials.
Author: OVSV, Austrian Amateur Radio Society

PLC in Finland
Internet: http://www.darc.de/referate/emv/plc/plc-oh.pdf
Summary: PLC for the present rejected by Finnish Telecommunication Minister. In the Finnish Amateur Radio League's monthly magazine "Radioamatööri" 06/2001 on pages 12 to 17, there is an article about a session held on PLC in the Finnish Telecommunication Administration Center (Telehallintokeskus, THK) on May 16th , 2001. The Finnish Minister of Transport and Telecommunication, Mr. Olli-Pekka Heinonen, had answered to the question of a Member of Parliament regarding the introduction of PLC in Finland: For the present, because of the technical problems encountered, introduction of PLC technology is not possible.

Japan's Government Concluded That It is not suitable to allow HF band for PLC (English)
Internet: http://www.jarl.or.jp/English/4_Library/A-4-1_News/jn0208.htm)
Summary: On April 30, 2002, the Ministry's study group on PLC held its first public hearing with JARL, Association of Radio Industries and Business, and others. At the meeting, the results of collaborated field tests, which were held in January, 2002, were reported. The tests included monitoring leakage of electric waves from power lines -- specifically in cases of providing Internet access via power lines to homes. In this way, JARL actively cooperated with the group. As a result, MPHPT's

study group officially announced in its fifth meeting on July 31 that it is too early to allow PLC between 2 MHz and 30 MHz due to hazardous effects on HF users. This news was reported by major newspapers including Yomiuri, Asahi and Mainichi, as well as the major financial daily, Nihon Keizai Shimbun.
Author: JARL

Sharing studies between the radio astronomy telescopes and the power line communication systems in the HF region
Internet: http://www.qsl.net/jh5esm/PLC/isplc2003/isplc2003a7-4.pdf
Summary: Radio Astronomy has frequency allocations in 13.36-13.41 MHz and 25.55-25.67 MHz on a primary basis worldwide. These bands are extensively used by radio astronomers to observe electromagnetic waves emitted by the Sun, the Jupiter and other large, gaseous planets in the solar system. The powers from a single PLC system in the above radio astronomy bands are --33 dBW and --29.2 dBW respectively and therefore the PLC systems seem to be a harmful interference source for the radio astronomical observation in the HF band. It is necessary to keep an adequate separation distance to avoid harmful interference to the radio astronomy telescope, and we calculated the separation distance based on the free-propagation method. We obtained a value of 424 km. If the PLC system is widely deployed, it is sure that the interference level increase greatly and the separation distance will become much larger. Thus it was recognized that it is quite difficult to share frequencies with the PLC systems and radio astronomy telescopes, at least, in Japan, and that a new technology to dramatically reduce leaked emissions from the power lines are crucial for the PLC systems to coexist with other radio communications services.
Authors: by M.Ohishi, J.Nakajima and M.Tokumaru

Campaign Against Power Line Communications Operating in the HF Bands
(English)
Internet: http://www.qsl.net/jh5esm/PLC/JARLcampaignPLCe.pdf
Summary: This paper gives a tutorial of PLC and presents summaries of the interference level from measurements made of several access PLC field tests in Japan. Japan has chosen not to allow access PLC at this time.
Author: JARL, Cosy MUTO, JH5ESM